

*A review of the problem of drug dependence is presented on the basis of what knowledge is available. Prospects for the future are discussed.*

## **DRUG CULTURE IN THE SEVENTIES**

*K. D. Charalampous, M.D.*

**D**RUG dependence is a multifaceted problem, the subject of many disciplines, with physiological, pharmacological, toxicological, behavioral, sociological, and legal aspects. It may be associated with the minor tranquilizers or anti-anxiety drugs—meprobamate, chlordiazepoxide; sedatives and hypnotics—barbiturates, glutethimide, chloral hydrate; stimulants—amphetamines, methylphenidate, phenmetrazine, cocaine; ethyl alcohol and nicotine; the natural and synthetic analgesics—opiates, pentazocine; hallucinogens—LSD, STP, and, of course, cannabis.

Some individuals use drugs occasionally, others frequently. They may use them singly, but often do so in groups. Usually, the users move from one category to another. Not surprisingly, those with emotional problems use them more frequently than those without (Hinckley). No group or social class, and, for that matter, no country, has failed to be touched by this problem.

The use of these drugs, under any auspices and irrespective of rationale, may affect a person psychologically, causing mood disturbances, disorders of thinking, impairment of insight, phases of excitement or panic, and occasionally psychotic states. They may modify and even stunt the user's social maturity, and may lead him to prohibited social interactions.

Besides the phenomena of tolerance and cross-tolerance, drug potentiation,

tissue dependence, flashbacks, impurities in an inconsistent dosing of the agents may lead from change of function to physical damage and fatalities. The incidence of any of these effects may be related to the host—the user, the agent—the drug, and the setting—the environment.

On the other hand, drug dependence may not follow the use of any of these drugs, and the behavior of the individual after either acute or even frequent administrations is not predictable.

As Daniel Freedman succinctly expressed it, "The fact is that one, several or many non-toxic and properly scheduled doses of heroin, marijuana, alcohol, cocaine, amphetamine, LSD, barbiturate or chlordiazepoxide need not necessarily produce a compelling habit or have harmful consequences to an individual or society. Furthermore, marijuana in excess does not commonly lead to crimes of violence, alcohol in excess does, and heroin in sufficient supply does not. Nicotine and alcohol in chronic excess can lead rather directly to physical disease, but heroin and probably (not certainly) LSD, amphetamine and cocaine do not . . ."

Human beings do feel a need to avoid tension, relieve boredom, avoid frustration, and find a happy state between their search for novelty and fear of the unexpected. In the quest for these goals, every population has its own choice of drugs. The young, of course, cause the greatest concern, since drug

procurement and drug indulgence sap their energies, undermine their motivation, induce a misperception of objects for identification and of ideals for adoption, and interfere with the crystallization of character. After mistrust and rejection of the outside world, they seek truth, guidance and meaning within themselves, invariably in vain. The prolongation of the chaotic period of adolescence increases the tendency to turn to drugs to suppress anxiety and help with the dissipation of depression through pharmacological euphoria.

Some vignettes of the current status of drug family-American society interactions seem relevant.

Heroin addiction among the young is progressively increasing, with no signs of abating. In New York City, where more than 100,000 heroin addicts reside, there were more than 900 fatalities due to drugs, mainly heroin, in 1969; 224 of the victims were teenagers. For the age group 15 to 35, drug abuse is now the leading cause of death. The majority of these deaths are thought to be due to acute reaction to heroin overdosage or to hypersensitivity. Heroin addicts may subject themselves to more than 1,000 intravenous injections each year, thus being exposed repeatedly to possible antigens in the crude heroin or in its adulterants. Concentration of heroin in analyzed street samples ranged from one to 77 per cent. A recent study in Dallas, Texas, based on reports from 57,000 students of the Dallas Independent School District, indicates that almost three per cent of junior and senior high-school students report having used opiates at least once. For the more than 200,000 heroin addicts in the United States, the annual cost of their drugs is estimated at \$5 billion.

Although the response to treatment of the very young narcotic addict has been very discouraging, the general outlook is not as poor. The prognosis appears to improve with age. For the dependent

person, long-term supervision and support are necessary. Several programs have been initiated for the control of the problem, all of them as yet experimental. Some offer residential, others outpatient treatment. The status of the patient may be voluntary, on probation, or under commitment. Treatment modalities include psychotherapy, pharmacotherapy-blockade, using both short-acting and long-acting preparations, and antagonism, and social methods. Many programs consider the use of ex-addicts to be of great importance. Close supervision, including chemical analysis of biological samples, is necessary to improve the prognosis. All programs emphasize education and prevention.

A recent study by Noble in England underscores the findings of most workers that virtually all narcotic takers have used soft drugs beforehand, e.g. cannabis or amphetamines, although there is no pharmacological connection. Parry reported in 1968 that 27 per cent of U.S. adults surveyed use psychotropic drugs, and half of those surveyed have used psychotropic drugs at some time. A sizable percentage take stimulants. This heavy consumption seems to persist despite the passage of the Drug Abuse Control Amendments of 1965 (Public Law 89-74). In 1965, Dr. Sadusk of the F.D.A., in a report published later in the J.A.M.A., estimated that about 50 per cent of the 8 billion or more amphetamine tablets produced each year finds its way into illicit channels of distribution. According to present estimates, legitimate and clandestine industrial production has reached the staggering amount of 12 billion tablets a year. With only a few clinical indications for the use of these drugs, it is apparent that the greater part became a subject of abuse.

Among the young, amphetamine abuse often follows closely that of the hallucinogens and has created a public health problem second only to that of

the opiates. Tolerance to amphetamines, psychological dependence, some tissue dependence, psychological effects of agitation and aggressive outbursts on acute administration, and toxic states indistinguishable from paranoid schizophrenia after chronic use, have been described. Sleep deprivation and the letdown feeling upon dissipation of the effects of the stimulant lead to abuse of other drugs. Psychopharmacologists for a number of years have discounted any useful antidepressant effects from the amphetamines. Other physicians treating obesity have noted that the anorexic effects are short-lasting. To this observer, the recent initiative of the F.D.A. to curb the promotional claims for the amphetamines and methylphenidate is not only appropriate, but overdue.

I chose not to discuss the hallucinogens because their effects as contributors to multi-habitation on one hand, and their adverse effects to about 15 per 1,000 of recipients on the other, are well-recognized. Nevertheless, the recent growth in use of LSD attests to the futility of scare tactics like "fractured chromosomes" that are based only on preliminary observations of yet unknown significance.

The problem of marijuana is truly chaotic. To this observer, the conclusions of the Indian Hemp Drug Commission Report of 1894 are as timely today as then. Weak preparations of cannabis may not be detrimental to the health of the user, but potent preparations like purified hashish, after prolonged use, can be expected to cause damage. Discussion of the preliminary findings that have been published could only cause confusion. The "scheduling" of marijuana together with heroin cannot cease to perplex. And the expense of more than \$100 million allegedly spent by the state of California to enforce its marijuana laws in 1969 is appalling. Concentrating our efforts on punitive measures seems a counterproductive in-

vestment of limited resources in money, but principally in manpower. But legalizing the drugs can only increase the problem. There is no indication that the consumption has plateaued. It moves progressively to young groups, and it also moves to older. Availability of drugs will further increase the number of abuses, gradually reaching more vulnerable hosts, and will augment morbidity rates. The Soviet Union with a lively problem in alcoholism, has practically no problems with other drugs of abuse.

I would like to make the following points for the consideration of public health professionals.

1) Methods for deglamorizing drugs should be explored. Pharmacotherapy in general must become more selective and better supervised. The over-the-counter supplies might well go under. Psychopharmacology and other branches of clinical pharmacology deserve more time in both undergraduate and postgraduate medical curricula. It is not enough to rationalize the problem as totally sociological; improving our prescribing habits is an important and necessary medical step.

2) Favoring or damning one drug of abuse and ignoring the others is not rational, and does not help in efforts for control. Support for the development of governmental and academic organizations, addressing themselves to all drugs of abuse in a comprehensive way, should be encouraged.

3) Efforts should be made to re-establish and justify credibility in medical personnel.

4) In the area of primary prevention, since peer group control is very important in regulating interest in drugs and drug experimentation, social efforts to promote the development and viability of groups which provide alternatives to preoccupations with drugs, should be encouraged. We must not ignore the synergistic effects of certain music and

literature. The unstable and immature groups deserve some protection.

5) More facilities are needed for comprehensive and continuous care, without emphasis of one treatment at the expense of others.

Drug abuse is not just a fad and a fashion and will not go away, but it will create many victims.

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Dr. Charalampous is Associate Professor, Department of Psychiatry, University of Texas Medical School at Dallas.

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## More Fallout from Space for Future Medicine

From the NASA Manned Spacecraft Center in Houston comes word that the "marriage" of medicine and engineering in the space program has resulted in significant technical developments, many of which are beginning to be used in the health care field. For example, different types of sensors developed to monitor body functions of astronauts in space and on the moon could have many health care functions. "Spray-on" sensors are already being used in ambulance units in some parts of the country. And sensors that monitor such things as blood pressure and heart activity could be connected to a time recorder to enable a physician to find out what is happening to his patient when the patient is at work or engaging in other activities. "Telediagnosis," widely used in the space program, could also be used for earthly purposes.

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